

What Is Claimed Is:

sub B3 1. A moving pictures encoding method, by which a  
frame of input signals of an interlaced image is treated as  
a picture, and prediction and encoding are performed for  
5 the picture in macro-block units from both a forward  
picture, which is temporally in the past, and a backward  
picture, which is in the future, the moving pictures  
encoding method comprising the steps of:

performing motion prediction between fields,  
10 which treat as a unit a field, which divides each picture  
in macro-block units into either odd numbers or even  
numbers of pixel scanning lines of the frame when encoding  
is performed in accordance with a prediction from both the  
forward picture and the backward picture;

15 selectively switching in picture units, as a  
prediction mode, between the use of prediction from a  
forward field motion vector for one field, and the use of  
prediction from a backward field motion vector for the  
other field;

20 generating a predictive picture corresponding to  
the selected prediction mode; and

encoding the input signals using the generated  
predictive picture.

25 2. A moving pictures encoding method, by which a  
frame of input signals of an interlaced image is treated as  
a picture, and prediction and encoding are performed for

the picture in macro-block units from both a forward picture, which is temporally in the past, and a backward picture, which is in the future, the moving pictures encoding method comprising the steps of:

5 performing motion prediction between fields, which treat as a unit a field, which divides each picture in macro-block units into either odd numbers or even numbers of pixel scanning lines of the frame when encoding is performed in accordance with a prediction from both the forward picture and the backward picture;

10 constantly using, as a prediction mode, prediction from a forward field motion vector for one field, and prediction from a backward field motion vector for the other field;

15 generating a predictive picture corresponding to this prediction mode; and

encoding the input signals using the generated predictive picture.

20 3. The moving pictures encoding method according to claim 1, further comprising the steps of:

25 detecting a scene change of said input signal picture in a field unit, which is divided into either odd numbers or even numbers of pixel scanning lines of said frame; and

selecting a prediction from a forward field motion vector for one field, and a backward field motion

vector for the other field, relative to a picture, in which a scene change exists between the fields of the frame in the input signal picture.

5           4. A moving pictures encoding method, which performs encoding by treating an interlaced image as an input signal, and treating a macro-block as a unit, the moving pictures encoding method comprising the steps of:

10               detecting a scene change of the input signal picture in a field unit, which is divided into either odd numbers or even numbers of pixel scanning lines of a frame;

              performing prediction from either each or both of a forward picture, which is temporally in the past, and a backward picture, which is in the future; and

15               encoding this input signal picture as field structure encoding for a picture, for which inter-picture prediction is performed from a picture of at the least both this forward picture and this backward picture, and for a picture, in which a scene change exists between intra-frame  
20               fields in this input signal picture.

5. A moving pictures encoding method, which performs encoding by treating a frame of input signals of an interlaced image as a picture, and treating a macro-block  
25               as a unit, the moving pictures encoding method comprising the steps of:

              detecting a scene change of this input signal

picture in a field unit, which is divided into either odd numbers or even numbers of pixel scanning lines of a frame; and

performing encoding for a picture, for which  
5 inter-picture prediction is performed from a picture of at the least both of a forward picture, which is temporally in the past, and a backward picture, which is in the future, and for a picture, in which a scene change exists between intra-frame fields in this input signal picture, treating  
10 either this forward picture, or this backward picture as the same data.

6. The moving pictures encoding method according to claim 5, wherein the encoding includes the steps of fixing  
15 the encoding prediction direction to one direction frame prediction; making the motion vector always equal 0, and also making the encoding difference data always equal 0; and treating the picture as the same data as either a forward reference picture or a backward reference picture.

7. The moving pictures encoding method according to claim 5, wherein the encoding includes the steps of  
20 treating said picture as the same data as either a forward reference picture or a backward reference picture; and setting  
25 sets either a forward reference picture or a backward reference picture as the current frame picture when setting the coded original picture.

8. An interlaced picture signal inputting method,  
which inputs an interlaced picture as input signals, the  
interlaced picture signal inputting method comprising the  
5 steps of:

detecting a scene change of this input signal  
picture in a field unit, which is divided into either odd  
numbers or even numbers of pixel scanning lines of a frame  
of this picture; and

10 repeatedly outputting one field relative to a  
picture in which a scene change exists between intra-frame  
fields in this input signal picture.

9. A moving pictures encoding method, which performs  
15 encoding by treating a frame of input signals of an  
interlaced image as a picture, and treating a macro-block  
as a unit, the moving pictures encoding method comprising  
the steps of:

detecting a scene change of this input signal  
20 picture in a field unit, which is divided into either odd  
numbers or even numbers of pixel scanning lines of a frame;  
and

repeatedly outputting one field of this picture  
when there is a picture for which prediction is performed  
25 from a picture of both of a forward picture and a backward  
picture, and a scene change exists between intra-frame  
fields in this input signal.

10. A moving pictures decoding method comprising the steps of decoding a moving pictures encoded signal corresponding to encoding that applies motion compensation corresponding to prediction from a forward field motion vector for one field, and a backward field motion vector for the other field.

11. A moving pictures encoding apparatus, in which a frame of input signals of an interlaced image is treated as a picture, and which performs prediction and encoding for the picture in macro-block units from either each of a forward picture, which is temporally in the past, and a backward picture, which is in the future, or from a bi-directional picture, the moving pictures encoding apparatus comprising:

field motion vector detecting means for performing motion prediction between fields, which treat as a unit a field, which divides each picture in macro-block units into either odd numbers or even numbers of pixel scanning lines of the frame when encoding is performed in accordance with a prediction from the bi-directional picture;

prediction mode selecting means for selectively switching in picture units, as a prediction mode, between the use of prediction from a forward field motion vector for one field, and the use of prediction from a backward

field motion vector for the other field;

motion compensating means for generating a  
predictive picture corresponding to a prediction mode  
selected in accordance with this prediction mode selecting  
5 means; and

encoding means for encoding this input signal  
using a predictive picture generated in accordance with  
this motion compensating means.

10 12. A moving pictures encoding apparatus, in which a  
frame of input signals of an interlaced image is treated as  
a picture, and which performs prediction and encoding for  
the picture in macro-block units from either each of a  
forward picture, which is temporally in the past, and a  
15 backward picture, which is in the future, or from a bi-  
directional picture, the moving pictures encoding apparatus  
comprising:

field motion vector detecting means for  
performing motion prediction between fields, which treat as  
20 a unit a field, which divides each picture in macro-block  
units into either odd numbers or even numbers of pixel  
scanning lines of this frame when encoding is performed in  
accordance with a prediction from this bi-directional  
picture;

25 motion compensating means for constantly using as  
a prediction mode prediction from a forward field motion  
vector for one field, and from a backward field motion

vector for the other field, and for generating a predictive picture corresponding to this prediction mode; and

encoding means for encoding this input signal using a predictive picture generated in accordance with this motion compensating means.

13. The moving pictures encoding apparatus according to claim 11, further comprising:

scene change detecting means for detecting a scene change of said input signal picture in a field unit, which is divided into either odd numbers or even numbers of pixel scanning lines of said frame; and

said prediction mode selecting means enters into a selection item a prediction from a forward field motion vector for one field, and from a backward field motion vector for the other field, relative to a picture, in which a scene change exists between the fields of this frame in this input signal picture.

14. A moving pictures encoding apparatus, which treats an interlaced picture as an input signal, and which treats a macro-block as a unit, the moving pictures encoding apparatus comprising:

scene change detecting means for detecting a scene change of said input signal picture in a field unit, which is divided into either odd numbers or even numbers of pixel scanning lines of a frame;



inter-picture predicting means for performing prediction from a picture of either each or both of a forward picture, which is temporally in the past, and a backward picture, which is in the future;

5 frame encoding means for encoding an input signal picture frame as a picture;

field encoding means for encoding an input signal picture field as a picture; and

10 encoding switching means for switching in frame units encoding in accordance with this frame encoding means and field encoding means,

and performing control so that encoding is performed using this field encoding means in accordance with this encoding switching means for a picture, for which  
15 inter-picture prediction is performed from a picture of at the least both of this forward picture and this backward picture, and for a picture, in which a scene change exists between intra-frame fields in this input signal picture.

20 15. A moving pictures encoding apparatus, which performs encoding by treating an interlaced picture as an input signal, and by treating a macro-block, which is a sub-block thereof, as a unit, the moving pictures encoding apparatus comprising:

25 scene change detecting means for detecting a scene change of an input signal picture in a field unit;

frame encoding means for encoding this input

signal picture frame as a picture;

inter-picture predicting means for performing prediction from a picture of either each or both of a forward picture, which is temporally in the past, and a backward picture, which is in the future; and

controlling means for performing control relative to a picture, for which inter-picture prediction is performed from a picture of at the least both of this forward picture and this backward picture, and for a picture, in which a scene change exists between intra-frame fields in an input picture, so as to encode this picture in accordance with this frame encoding means, having the same data as either a forward reference picture or a backward reference picture.

16. The moving pictures encoding apparatus according to claim 15, wherein:

said controlling means controls said frame encoding means so that a picture is encoded having the same data as either a forward reference picture or a backward reference picture, and has means for fixing an encoding prediction direction to one direction frame prediction; and

there are further comprised means for constantly making a motion vector 0; and

means for also constantly making encoding difference data 0.

17. The moving pictures encoding apparatus according to claim 15, wherein:

5 said controlling means controls said frame encoding means so that said picture is encoded having the same data as either a forward reference picture or a backward reference picture, and sets either a forward reference picture or a backward reference picture as a current frame picture when setting a coded original picture.

10 18. A moving pictures input switching apparatus, comprising:

15 scene change detecting means for detecting in a field unit a scene change of an interlaced picture to be inputted; and

means for repeating one field relative to a picture in which a scene change exists between intra-frame fields in this interlaced picture to be inputted.

20 19. A moving pictures encoding apparatus, which performs encoding by treating an interlaced picture as an input signal, and by treating a macro-block as a unit, the moving pictures encoding apparatus comprising:

25 scene change detecting means for detecting a scene change of this input signal picture in a field unit;

frame encoding means for encoding this input signal picture frame as a picture; and

inter-picture predicting means for performing prediction from a picture of either each or both of a forward picture, which is temporally in the past, and a backward picture, which is in the future,

5 and the frame encoding means performs encoding by repeating one field relative to a picture, for which inter-picture prediction is performed from a picture of both of a forward picture and a backward picture, and for a picture, in which a scene change exists between intra-frame fields  
10 in an input picture.

20. A moving pictures decoding apparatus, which corresponds to any of the moving pictures encoding apparatus, <sup>claim 11</sup> ~~according to claims 11 through 13~~, and which has  
15 motion compensating means corresponding to prediction from a forward field motion vector for one field, and from a backward field motion vector for the other field.